WHAT IS CLAIMED IS:

1. A method for transmitting data between a first station and a second station in an optical network, the method comprising:

receiving an input signal representing the data,

multiplexing the input signal into two or more portions,

performing an inverse fast Fourier transform on the two or more portions to create an orthogonal representation of the input signal,

modulating at least one laser diode, using the orthogonal representation, such that modulated data can be transmitted on an optical carrier between the first station and the second station.

2. The method of claim 1, further comprising receiving at least one additional input signals representing encoding information.

3. The method of claim 2, wherein the encoding information is selected from the group consisting of channel quality information, training symbol information, pilot tones, and synchronization information.

4. The method of claim 2, wherein the performing step further comprises performing the fast Fourier transform using the encoding information and the input signal.

5. The method of claim 2 further comprising generating forward error correction codes.

6. The method of claim 5, further comprising adding the forward error correcting codes to the two or more portions.

7. The method of claim 5, further comprising adding the forward error correcting codes to the orthogonal representation.

8. The method of claim 5, wherein the performing step further comprises performing the fast Fourier transform using the encoding information, forward error correcting codes, and the input signal.

9. The method of claim 1 further comprising modulating additional laser diodes such that the modulated data can be transmitted on additional optical carriers using at least one frequency.

10. The method of claim 1 further comprising modulating additional laser diodes such that the modulated data can be transmitted on additional optical carriers using different frequencies.

11. The method of claim 1 further comprising distributing the modulated data across two or more optical carriers, wherein each optical carrier receives a predetermined portion of the modulated data.

12. The method of claim 1 further comprising distributing the modulated data across two or more optical carriers, wherein an amount of modulated data to be carried by each carrier is dynamically allocated.

13. The method of claim 12 further comprising determining the amount of modulated data to be carried on the two or more optical carriers, wherein the determining is made by determining a channel quality of each optical carrier of the two or more optical carriers.

14. A method for transmitting data between a first station and a second station in an optical network, the method comprising:

receiving an optical input signal containing the data,

filtering the optical input signal to filter extraneous frequencies to create a filtered signal,

detecting errors in the filter signal,

correcting errors in the filtered signal to create a corrected signal,

performing a fast Fourier transform on the corrected signal to create two or more portions,

demultiplexing the two or more portions to extract the data.

15. The method of claim 14 wherein the demultiplexing step further comprises extracting an estimate of the channel quality.

16. A method for transmitting data between a first station and a second station in an optical network, the method comprising:

receiving an optical input signal containing the data,

filtering the optical input signal to filter extraneous frequencies to create a filtered signal,

performing a fast Fourier transform on the corrected signal to create two or more portions,

detecting errors in the two or more portions,

correcting errors in the two or more portions to create a plurality of corrected signals,

demultiplexing the plurality of corrected signals to extract the data.

17. The method of claim 15 wherein the demultiplexing step further comprises extracting an estimate of the channel quality.